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NORTON SOUND DISTRICT
SHELLFISH REPORT
to the
Alaska Board of Fisheries

By

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and
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INTRODUCTION

Norton Sound

The Norton Sound Section of the Northern Bering Sea District consists of all waters in statistical area Q that are north of the latitude of Cape Romanzof, east of 168 west longitude, and south of the latitude of Cape Prince of Wales (Figures 1 and 2). A large vessel summer commercial red king crab (Paralithodes camtschatica) fishery has existed in the Norton Sound Section from 1977 through 1992 (Appendix Table 2). No summer commercial fishery occurred in 1991 due to a lack of staff necessary to manage the fishery. The budget had been cut the previous winter. In 1992, the large vessel summer commercial fishery resumed. Regulation changes adopted during the March 1993 Board of Fisheries meeting changed the character of the fishing fleet to that of a small boat fleet. A superexclusive designation went into effect for the Norton Sound commercial crab fishery June 27, 1994. A vessel registered for the Norton Sound crab fishery may not be used to take king crab in any other registration area during that registration year.

The National Marine Fisheries Service conducted their most recent trawl survey to examine the abundance of Norton Sound red king crab in late August 1991 (Appendix Table 5). The results of that survey as compared to the 6 previous trawl surveys show a gradual trend of increasing abundance since the low recorded in 1982. The 1991 survey found 3.4 million pounds of legal king crab in the commercial fishing district. NMFS has not made a survey of Norton Sound since 1991. The quota for the Norton Sound Section for the 1996 season was set at 340,000 pounds, to approximate an exploitation rate of 10%. The Alaska Department of Fish and Game conducted a trawl survey to examine the abundance of Norton Sound red king crab from August 7 - 18, 1996. A population estimate from this survey will not be available until March 1997.

St. Lawrence Island

The St. Lawrence Island Section lies immediately west and north of the Norton Sound Section. Because the Bering Sea crab fleet bases in Dutch Harbor, the St. Lawrence Island Section has been managed by ADF&G's Westward Region's Dutch Harbor office, until recently, since they have been the primary commercial group interested in that area. The only reported commercial catches to date in the St. Lawrence Island Section were made in 1983 when 52,557 pounds of blue king crab were delivered from 13 landings, in 1989, when 3,603 pounds of red king crab and 984 pounds of blue king crab were delivered from 8 landings, in 1992 when 53 pounds of blue crab were landed and in 1995 when 7,913 pounds were delivered from three landings.

In 1983, the commercial crab fleet concentrated near the southeast shore of St. Lawrence Island. The following year a regulation proposal to close the waters within 10 miles of all inhabited islands within the section was adopted in an attempt to protect stocks targeted by

local fishermen and reduce impacts on subsistence marine mammal harvests during the winter. During the 1989 season, three fishing vessels prospecting in that section found relatively few blue king crab near rocks and shoals still open to commercial fishing, but red king crab were discovered in low densities near Kivalina, the northern boundary of the section. The villagers of Little Diomede Island have also traded and sold winter caught blue king crab with residents of Nome and other villages for years. The Department has not been able to obtain an accurate estimate of the magnitude of this trade. The remoteness of this village is also a factor contributing to the lack of catch records. Current regulation allows the commercial harvest and sale of king crab near shore during the winter. The Board provided the same provisions in the regulation as are in effect for Norton Sound to allow a commercial winter fishery. However, local residents of St. Lawrence Island have decided not to export any of their winter catch for commercial sale.

COMMERCIAL FISHERY

Norton Sound Summer Commercial Fishery

The 1996 summer commercial red king crab fishery opened at 12 noon, July 1 in the Norton Sound Section. Fishermen did not set pots until July 9 due to a fishermen's strike. A total of 51 catcher vessels were registered for the summer commercial crab season. Beginning in 1996, a moratorium on new vessels, greater than 32 feet, entering the fishery was put in place. All but 9 of these vessels were 32 feet or less. These 9 larger vessels ranged from 40 feet to 58 feet. Forty-one vessels actually made deliveries and 50 permits were fished. There were three land based processors that took part in the fishery. No floating crab processors or catcher/processors operated in Norton Sound during the 1996 summer fishery. Therefore, no independent observer was placed on board a commercial vessel. One ADF&G fishery biologist was stationed in Nome to monitor the fishery, act as onboard observer/sampler on catcher vessels and sample legal crab delivered to buyers in Nome. This was the only person dedicated to collecting essential biological and management data, which is necessary in determining the magnitude and location of the commercial harvest and tracking the status of the stock. The observer also provides the means to enforce size and sex restriction regulations that protect the resource. Public concern for declining nearshore catches and the apparent shift in crab distribution caused managers to announce their intent not to relax the nearshore closure line as their practice had been in recent years. As a result of crab distribution and the proximity to the closure line, roughly one-half the crab fleet chose to operate from the port of Golovin. Since the department has no staff stationed at Golovin, the decision was made to conduct the sampling onboard the trawl vessel on contract to gather population data. The sampler became a crew member for the 1996 Norton Sound king crab trawl survey conducted in August.

Catch reporting logs were kept by buyers and by skippers of catcher vessels for each statistical area fished. Buyers verbal reports were relayed daily by 9:00 a.m. to the

ADF&G office in Nome. Fish tickets were due in to the ADF&G office on Friday of each week throughout the duration of the fishery. Vessel reports from fishermen and Catcher/Seller fish tickets were required every Monday for the duration of the fishery. Compliance with reporting requirements was good. Daily catch statistics can be found in Table 1 and Figure 3. During the final two weeks of the commercial fishery, various fishermen reported anywhere from 10% to 50% of their legal catch in a soft shell, newly molted condition.

Fourteen percent of the total harvest was caught by Norton Sound fishermen, 43% of the harvest was caught by Yukon Delta fishermen, and 43% was caught by fishermen based in other parts of the state and outside of Alaska.

Four landings were made by fishermen registered as catcher sellers. Two land based processing companies operated out of Nome. Another company bought live crab, and one delivery was made to a company on St. Paul Island. This was due to the fact that a catcher vessel left the grounds of the Norton Sound District with crab on board. During the 1996 fishery, one tender was used to transport live crab from Eastern Norton Sound.

Board of Fisheries regulations specific to Norton Sound Section are:

1) 5AAC 34.915, which directs the Department to manage the Norton Sound summer king crab fishery for a harvest of one half the exploitation rate determined under 5AAC 34.080.

2) 5AAC 34.935, which established a closed area with a defined boundary approximating 15 miles from the beach in the Norton Sound section, to protect a long established winter subsistence fishery.

3) 5AAC 34.925 (i) and (j), requiring pot tags and limiting vessels of 125 feet in length or less to 40 pots each and larger vessels are limited to 50 pots.

Early results from the trawl survey and catch per unit effort data from the fishery indicated a significant decline in the legal crab biomass by late August. Fishermen reported the greatest proportion of molting crab in their catch since the earliest years of the fishery. There was speculation the season would be extended because the harvest was well short of the guideline, but managers felt the decline and molt were both reasons to close the fishery on the scheduled date.

Statistical Summary

A total of 50 permit holders on 41 catcher vessels made 264 landings in the 1996 Norton Sound summer commercial red king crab fishery. The total number of crab caught was 75,695 and the total number of pots pulled was 10,570 (Table 1). The CPUE was 7.1 crab/pot. Total harvest was 226,721 pounds of king crab. The harvest goal was 340,000 pounds. The exvessel price for crab was $2.29 per pound. The value of the 1996 fishery

is estimated at $519,000. This is the lowest summer commercial harvest since the Norton Sound crab fishery transition to a small vessel fishery in 1993 (Appendix Tables 2 & 3, Figure 7). During the final two weeks of the fishery, reports by commercial fishermen of double shell and newly molted, soft shell crab increased.

Fish ticket records show that the 1996 season's largest fishing effort (46.2%) and harvest (51.6%) occurred in statistical areas 636401 and 626401(Table 2) just south of Golovin Bay. Prior to 1995, the fishery had typically concentrated in statistical areas south of Nome. In 1995, fishing started in the usual areas, but catches were low and fishermen spread their effort. Late in the season the best catch rates were found in the statistical areas south of Golovin Bay. During the 1996 season, fishing concentrated in the same areas that produced the best catches at the close of the 1995 season. Comparisons of the annual summer commercial harvest of crab by statistical area can be found in Appendix Table 1.

Based on fish ticket data, statistical area 646301 had the greatest CPUE of 17.4 crab/pot (Table 2). Overall CPUE for the 1996 season was 7.1 crab/pot. Appendix Tables 2 and 3 equate previous commercial crab harvest, effort, CPUE and value to the 1996 season. During the 1996 fishery, there were approximately 1,640 pots on the fishing grounds. The mean CPUE of the previous seven years with a similar number of pots deployed on the grounds is 10.5 (Appendix Tables 2 and 3).

Statistical area 676300 had the greatest average weight of 3.55 pounds per crab according to fish ticket data (Table 2). Overall average weight per crab for the 1996 season was 3.0 pounds. This compares to the combined average weight of 3.03 pounds of the previous seven years.

Commercial Catch Sampling

Carapace length measurement and shell age were collected from 787 legal male red king crab throughout the duration of the 1996 summer fishery. Carapace age was classified as new (11 months old) or old (at least 23 months old) (Table 3, Figure 4). Overall mean carapace length of the legal male red king crab sampled was 117.1mm (Table 3). The 1996 season's legal male new shell/ old shell ratio was 64% new shell to 36% old shell (Table 3). This compares to the previous seven year average of 71% new shell to 29% old shell. Generally, the 1996 proportion of new shelled crab is down. The recent average was affected by the 1994 ratio when the normal ratio was reversed and only 29% of the sampled crab had new shells.

Recruit king crab made up 30% of the harvested stock sampled during the 1996 commercial season (Table 3). Total post recruits made up 70% of the harvested stock sampled. The 1996 and 1995 commercial crab fishery showed a great improvement in recruitment compared to the 1994 season (Appendix Table 4). The 1995 season showed

the highest recruitment since the 1986 summer fishery and was probably due in part to a rebounding affect from the previous year.

No sublegal male or female king crab information was collected from commercial vessels during the 1996 summer commercial king crab fishery. Biological sampling was conducted aboard the chartered trawl vessel, Peggy Jo and those results are provided later in this report.

1996 Norton Sound King Crab Trawl Survey

The Department conducted a king crab trawl survey August 7 through August 18, 1996. There were 479 measurable red king crab caught. The composition of the crab catch was 66 legal male, 248 sublegal male, and 165 female red king crab (Appendix Table 5). A population estimate using data gathered during the trawl survey will not be available until January 1997. Length frequency, shell age, and ovigerity information was collected and analyzed for the purpose of this report. This information is preliminary.

A total of 314 male red king crab were caught during the survey. The length frequency distribution of male crab captured during the 1996 trawl survey was 79% prerecruit, 7% recruit, and 14% postrecruit (Table 4). During the 1996 winter crab study the distribution of male crab was 64.3% prerecruit, 10.1% recruit, and 25.5% postrecruit (Rob, 1996). The length frequency distribution of male crab in both surveys are comparable. Approximately 10% of the male red king crab caught during the 1996 survey had soft shells or new-pliable shells. These crab had molted just before being caught. A number of double shell male crab were also observed. This along with fishermen reports, indicate that the male red king crab had begun their seasonal molt in mid August. It is believed that male red king crab in Norton Sound molt from late August to October (Brannian, 1987). It seems that male crab began to molt earlier in August this year than has been seen in the past.

One hundred and sixty-five female red king crab were captured during the survey. Juvenile female crab composed 66% and adult female crab 34% of the catch (Table 5, Figure 6). Juvenile crab had carapace lengths that ranged from 23 mm to 72 mm. Mean length for juvenile crab was 63 mm. Adult female crab had carapace lengths ranging from 68 mm to 110 mm. Mean length for adult female crab was 81.3 mm. Nineteen percent of the adult female crab had a clutch size of 90-100%, 42% had a clutch size between 60-89%, 14% had a clutch size between 30-59%, and 5% had a clutch size between 1-29%. Twenty percent of adult female crab captured had no clutch present. Some of those barren females are undoubtedly juvenile crab. For the adult female crab examined, egg color was observed to be purple or purple brown. No eyed eggs were observed.

Tagged Crab

During the 1996 summer commercial crab fishery, a new concept for rewarding the return of tagged crab was used. Baseball caps picturing a crab and the words "Norton Sound" and "Tag Reward" were used to entice commercial fishermen to report and return tagged crab to the ADF&G office. This replaced a $3.00 reward. Twenty four tagged crab were returned during the summer fishery. Only three of these returned crab had no information available. In 1995 fishery, ten of 23 tagged crab were returned with no useful information. This is a great improvement, and most fishermen reported that they would return tagged crab to get a hat. Of the crab recaptured during 1996, mean growth per molt was 13mm. One sublegal crab tagged in the 1996 winter crab project and captured during the 1996 summer fishery appeared to have molted just prior to being caught. This crab had a newly molted, hard shell at least 1 month old. It had grown 19 mm. One crab tagged in the 1990 winter study and caught during the 1996 summer fishery grew 34 mm in 6 years. This indicated that the crab had molted 3 times and skip molted 3 times.

Enforcement

The Fish and Wildlife Protection officer was able to patrol the fishery using a chartered vessel once during the fishery. Surveillance using a twin engine airplane was conducted twice during the 1996 fishery. Good weather allowed for tank inspections and registrations of all vessels. Fishermen violations included: fishing with no permit holder (1), falsified fish tickets (2), illegal tendering (4), overlimit of gear (1), and failure to report (2). Investigations are still ongoing at this time regarding other possible violations.

Norton Sound Winter Commercial Fishery

Regulation allows a winter commercial fishery in the Norton Sound Section from November 15 through May 15, the fishery typically takes place near Nome. The winter commercial fishery is required to take place from the ice, not from vessels. During the winter of 1995-1996, nine commercial fishermen reported selling a total of 1,778 red king crab (Appendix Table 7). The villages east of Nome reported only limited harvests of crab. Ice conditions were generally unfavorable throughout Norton Sound. Other than the community of Nome, only Unalakleet reported a very small harvest. Several fishermen from Nome moved their gear 25 miles to the east in an attempt to find more stable ice. They reported taking 11% of the commercial harvest from that statistical area. This was the first time Nome fishermen ranged that far from the community with that level of effort.

The harvest is divided between local residents who buy crab directly from the fishermen and other non-local markets such as Anchorage. Crab are sold in Nome for six dollars per crab, roughly $2.00 per pound, while in Anchorage the price was approximately $3.50 per pound. The resulting average season price was $3.19 per pound for all the commercial

product. The 1995-1996 winter catch of 5,181 pounds was estimated to be worth about 16,431 dollars.

The winter crab fishermen generally use crab pots but some use handlines to "prospect". Deploying pots through sea ice is laborious, but hand lines can be dropped through a large ice auger hole in a short period of time. The other advantage of hand lines is that during periods of favorable weather hand lines may be deployed from new, less stable ice without the risk of loosing more expensive crab pots. Most fishermen consider commercial crabbing a sideline and hold other jobs. Usually, two or three of the winter crab fishermen sell the majority of the crab. Because the volume of crab involved is low, no processor has found it profitable to operate locally. The crab sold locally are all sold fresh as are those shipped to Anchorage or other non local markets. During the mid-winter months, fishermen find it difficult keeping the crab from freezing. Many Nome residents prefer to buy frozen crab since they are able to extract the meat prior to cooking. Fresh frozen crab are easily marketed in Nome, but are not accepted in Anchorage markets.

SUBSISTENCE FISHERY

Red king crab are utilized by Norton Sound residents mainly during the winter. Fishing occurs through cracks or holes cut in the ice with the use of handlines and pots. In order to document trends in the subsistence harvest, the Board of Fisheries enacted a regulation in 1977 requiring subsistence fishermen in Norton Sound to obtain a permit prior to fishing and to record daily effort and catches on these permits (Appendix Table 7).

The first year subsistence permits were required had the highest number of permits issued to date and a relatively high harvest rate were recorded. The fishery declined sharply the following year and remained at very depressed levels throughout the 1981-82 season. The lack of success in the winter crab fishery during some past years has been attributed to a declining crab population caused by the removal of crab in the summer commercial fishery together with low recruitment, low effort due to poor ice conditions, and changes in the nearshore winter distribution of crab. All these factors probably had some effect on the success of the winter fishery in varying degrees. During the 1978-79 winter fishery, the king crab population was still in relatively high abundance. Despite this relatively large population, winter catches were the poorest on record indicating that the major factors limiting winter catches were probably poor ice conditions and the distribution of crab. During the winter of 1981-82, poor winter catches could more reasonably be attributed to a declining crab population since the crab population was at its lowest documented level. Subsistence fishing success during the winters of 1982-83 through 1986-87 had improved due to a rebuilding of the population and increased use of more efficient gear (pots instead of handlines). Unstable ice conditions and record snowfalls adversely effected the 1987-88, 1988-89, and 1992-93 catches. During years of stable ice conditions, approximately 100 fishermen have averaged 100 crab each.

The 1995-1996 season was beset with poor ice conditions. Frequent storms limited the extent of the shorefast ice and fishers had difficulty keeping their pots and finding suitable locations to fish. Of the 44 permits returned 35 reported fishing. Twenty-one fishers reported using pots, 8 reported using handlines, and 5 reported using a combination of the two gears. Permit data indicates the subsistence harvest consisted of 1,675 male crab and four female crab. Those fishermen reported harvesting 65% of the male crab the caught and 1% of the females caught.

STOCK STATUS / RESEARCH

There has been a change in the character of the summer commercial fishery since 1993 due to regulation changes affecting pot limits, opening dates and a regulation making Norton Sound a superexclusive registration area. The quality and quantity of data collected since the 1993 summer crab fishery has differed greatly from previous years due to the nature of the small vessel fishery. No floating processor or catcher processor took part in the 1996 fishery, therefore no independent observers were onboard commercial vessels.

The ADF&G fishery monitor did not have the opportunity to make observations on small catcher vessels during the 1996 fishery. No information was collected on observed pot lifts, sublegal male and female length frequencies, and catch rates of legal and sublegal crab during the commercial fishery. However, sampling of the commercial catch did occur on some deliveries made in Nome. This is important to ensure size limits are being enforced, and to assist management biologists in determining recruitment and health of the crab population.

In 1976, when monitoring of the Norton Sound king crab population first began, the population was mainly composed of prerecruit and recruit crab. The initial population assessment survey by the NMFS estimated the legal male king crab population at 8.1 million pounds (Appendix Table 5). The legal male crab population peaked in 1978 at an estimated 11 million pounds. During the 4 years following 1978, recruitment into the legal male crab population was very low. Subsequent NMFS surveys in 1979 and 1982 documented a population of predominantly postrecruit crab, and estimated the population had declined to 2.6 million pounds by 1982. Beginning in 1981, sublegal crab abundance began to increase, and by 1983 recruitment into the legal male population also began to increase. No assessment work was conducted in 1983 or 1984. However, samples of the commercial catches indicated a significant increase of recruit crab into the legal male population; from a historic low of 10% in 1981 to 59% in 1984.

In 1985, both NMFS and ADF&G conducted population assessment surveys in Norton Sound (Appendix Table 5). After the commercial fishery in 1985, NMFS conducted a population assessment survey using trawl gear over a slightly larger area than that surveyed by the Department. Male king crab sampled in NMFS trawls were in the process of or had just molted with the result being that their estimate of 3.4 million pounds of legal male king

crab included some recruitment. Adjusting this estimate for molting, and including the summer commercial harvest, an estimated three million pounds were present prior to the 1985 August fishery. Both surveys documented relatively substantial numbers of recruit crab and a healthy percentage of prerecruit crab.

During September of 1988 NMFS conducted a fifth population assessment with trawl gear. They sampled an area roughly the same size as in 1985, but increased sampling frequency in the proposed mineral lease area near Nome. The timing of the study, which occurred during the male molt, was almost a month earlier than similar surveys in the past. Nearly all the 1988 catch was in pre-molt condition. NMFS estimated 3.0 million pounds of legal male and 1.0 million pounds of prerecruit-one male red king crab; totaling 4.0 million pounds. Annual mortality was estimated at approximately 20% or 0.8 million pounds. Ignoring growth and the winter harvests, the population prior to the 1989 summer fishery would have been 3.2 million pounds, very close to the 1985 trawl estimate of 3.4 million pounds.

NMFS conducted a sixth trawl survey of Norton Sound during late August 1991 with a reduced number of tows. Each station had only a single sampling tow, as compared to each station having both a day and night tows during previous surveys. This reduction in sampling had the effect of introducing more variability into the estimate. The legal crab biomass in the summer fishing area was estimated to be 3,400,000 pounds and the total Norton Sound legal biomass was estimated to be 4,009,000 pounds. Since the survey occurred prior to the molt, a mortality of 10% was assumed for the year following the estimate. With no summer or winter fishery data to compare with the survey results, a conservative biomass of 3,400,000 pounds was used as the basis for the 1994 harvest guideline. The Norton Sound red king crab population was thought to be stable with harvest set near 10%.

FUTURE INVESTIGATIONS

The trawl survey which occurred during the summer of 1996 in Norton Sound was made possible by a budget increment passed by the legislature. A qualitative survey summary report will be final in early December. A red king crab population estimate will be available in early January. Population estimates of halibut and some other potentially valuable species will be attempted using data collected from that survey and will be made available during early 1997. Both funding for a sustained winter research program and a triennial trawl survey to evaluate Norton Sound crab populations were provided for in that legislation. A winter pot survey is planned during February, March, and April 1997 and the next trawl survey to generate a population estimate is planned for 1999.

OUTLOOK FOR 1997

The outlook for 1997 is not yet complete. The trawl survey results are not fully analyzed; but, a reduced harvest guideline is the most likely result of that work. The biomass of legal male red king crab is down dramatically from the 1991 survey. The number of sublegal males and female king crab also seem to have declined, but not as dramatically. The staff will attempt to complete the population estimate in January of 1997 and a meeting to set the exploitation rate and harvest strategy for the next several years is tentatively scheduled for March.

Table 1. Daily catch (using fish ticket data) for the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, July 1 - September 3, 1996.

Date	Permits	Landings	Number of Crab	Lbs of Crab Harvested	Cumulative Total (lbs)	No. of Pots Pulled	Average Weight	CPUE
10-Jul [a]	2	2	749	2,249	2,249	77	3.00	9.7
11-Jul	4	4	176	510	2,759	98	2.90	1.8
12-Jul	13	13	1,891	5,419	8,178	504	2.87	3.8
13-Jul	6	6	1,429	4,125	12,303	291	2.89	4.9
14-Jul	9	9	3,277	9,265	21,568	410	2.83	8.0
15-Jul	2	2	430	1,204	22,772	80	2.80	5.4
16-Jul	12	12	2,495	7,816	30,588	365	3.13	6.8
17-Jul	5	5	1,146	3,335	33,923	199	2.91	5.8
18-Jul	12	12	2,551	7,533	41,456	404	2.95	6.3
19-Jul	5	5	1,369	4,157	45,613	190	3.04	7.2
20-Jul	4	4	3,385	9,635	55,248	240	2.85	14.1
21-Jul	3	3	768	2,250	57,498	102	2.93	7.5
22-Jul	5	5	2,215	6,436	63,934	237	2.91	9.3
23-Jul	1	1	1,000	3,000	66,934	80	3.00	12.5
24-Jul	2	2	84	244	67,178	49	2.90	1.7
25-Jul	1	1	120	371	67,549	40	3.09	3.0
26-Jul	3	3	2,031	5,944	73,493	190	2.93	10.7
27-Jul	4	4	845	2,687	76,180	146	3.18	5.8
28-Jul	16	17	4,535	13,366	89,546	589	2.95	7.7
29-Jul	5	5	2,498	7,350	96,896	222	2.94	11.3
30-Jul	2	2	349	940	97,836	80	2.69	4.4
31-Jul	3	3	775	2,333	100,169	110	3.01	7.0
1-Aug	2	2	335	1,010	101,179	80	3.01	4.2
2-Aug	3	3	3,358	10,018	111,197	200	2.98	16.8
3-Aug	2	2	109	328	111,525	80	3.01	1.4
4-Aug	11	12	3,168	9,595	121,120	490	3.03	6.5
5-Aug	3	3	99	276	121,396	58	2.79	1.7
6-Aug	3	3	566	1,646	123,042	120	2.91	4.7
7-Aug	9	10	3,094	9,043	132,085	456	2.92	6.8
8-Aug	3	4	607	1,653	133,738	160	2.72	3.8
9-Aug	1	1	1,640	4,521	138,259	80	2.76	20.5
10-Aug	2	2	1,943	5,490	143,749	200	2.83	9.7
11-Aug	7	7	1,547	4,975	148,724	251	3.22	6.2
12-Aug	6	6	927	2,738	151,462	297	2.95	3.1
13-Aug	2	2	460	1,497	152,959	80	3.25	5.8
14-Aug	1	1	309	898	153,857	80	2.91	3.9
15-Aug	9	9	1,547	4,918	158,775	292	3.18	5.3
16-Aug	4	4	608	2,010	160,785	157	3.31	3.9
17-Aug	8	8	2,733	8,140	168,925	307	2.98	8.9
18-Aug	4	4	1,199	3,645	172,570	238	3.04	5.0
19-Aug	1	1	971	2,915	175,485	120	3.00	8.1
20-Aug	7	7	2,035	6,182	181,667	300	3.04	6.8
21-Aug	9	9	1,272	4,403	186,070	240	3.46	5.3
22-Aug	2	2	1,009	2,949	189,019	80	2.92	12.6
23-Aug	4	5	1,158	3,523	192,542	260	3.04	4.5
24-Aug	2	2	1,356	4,118	196,660	120	3.04	11.3
25-Aug	1	1	878	2,478	199,138	40	2.82	22.0
26-Aug	8	8	2295	7,367	199,138	338	3.21	6.8
27-Aug	1	1	225	777	207,282	40	3.45	5.6
28-Aug	2	2	419	1,339	208,621	61	3.20	6.9
29-Aug	3	3	574	1,678	210,299	80	2.92	7.2
30-Aug	1	1	145	423	210,722	14	2.92	10.4
31-Aug	10	11	3,072	10,130	220,852	337	3.30	9.1
1-Sep	4	4	900	2,702	223,554	81	3.00	11.1
2-Sep	4	4	352	1,167	224,721	90	3.32	3.9
3-Sep								
Totals:	50	264	75,695	226,721 [b]		10,570	3.00	7.1

[a] Crab fishermen on Strike through 7/9/96.

[b] Includes 4,139 lbs of deadloss (approximatly 2,490 lbs not reported on fish tickets).

Table 2. Red king crab summer commercial catch total (from fish ticket reports) by statistical area for the Norton Sound Section, Eastern Bering Sea, July 1 - September 3, 1996.

Statistical Area	Number	Pounds	Pots Pulled	CPUE	Average Weight (Lbs.)	Percent of Pots Pulled in Stat.	Percent Harvest in
626331	20	61	10	2.0	3.05	0.1	0.0
626401	15,226	45,045	1,694	9.0	2.96	16.2	20.1
636330	1,485	4,560	120	12.4	3.07	1.1	2.0
636401	24,317	70,677	3,142	7.7	2.91	30.1	31.5
646301	4,859	13,888	280	17.4	2.86	2.7	6.2
646330	969	2,894	239	4.1	2.99	2.3	1.3
646401	7,795	22,834	1,144	6.8	2.93	10.9	10.2
656330	4,938	15,446	862	5.7	3.13	8.2	6.9
656401	3,286	9,985	863	3.8	3.04	8.3	4.5
666330	7,597	25,519	1,201	6.3	3.36	11.5	11.4
666401	914	3,001	368	2.5	3.28	3.5	1.3
676300	154	546	37	4.2	3.55	0.4	0.2
676400	3,192	9,775	493	6.5	3.06	4.7	4.4
Total: [a]	74,752	224,231	10,453	7.2	3.00		

[a] Does not include approximately 2,490 lbs of deadloss not reported on fish tickets.

Table 3 Carapace length measurement summary of sampled legal male red king crab captured during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, July 1 - September 3, 1996

Carapace Length (mm)	New shell No.	New shell Ave Length Calc.	New shell %	Old shell No.	Old shell Ave Length Calc.	Old shell %	Total No.	Total Ave Length Calc.	Total %
95		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
96		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
97		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
98		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
99		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
100		0.00	0.0%	1	0.35	0.3%	1	0.13	0.1%
101	8	1.62	1.6%	2	0.70	0.7%	10	1.28	1.3%
102	7	1.43	1.4%	6	2.13	2.1%	13	1.68	1.7%
103	10	2.06	2.0%	2	0.72	0.7%	12	1.57	1.5%
104	17	3.54	3.4%	6	2.17	2.1%	23	3.04	2.9%
105	17	3.57	3.4%	6	2.20	2.1%	23	3.07	2.9%
106	16	3.39	3.2%	5	1.85	1.7%	21	2.83	2.7%
107	19	4.07	3.8%	8	2.98	2.8%	27	3.67	3.4%
108	11	2.38	2.2%	13	4.89	4.5%	24	3.29	3.0%
109	24	5.23	4.8%	8	3.04	2.8%	32	4.43	4.1%
110	29	6.38	5.8%	18	6.90	6.3%	47	6.57	6.0%
111	17	3.77	3.4%	7	2.71	2.4%	24	3.39	3.0%
112	13	2.91	2.6%	10	3.90	3.5%	23	3.27	2.9%
113	13	2.94	2.6%	13	5.12	4.5%	26	3.73	3.3%
114	19	4.33	3.8%	16	6.36	5.6%	35	5.07	4.4%
115	19	4.37	3.8%	15	6.01	5.2%	34	4.97	4.3%
116	28	6.50	5.6%	11	4.45	3.8%	39	5.75	5.0%
117	27	6.32	5.4%	8	3.26	2.8%	35	5.20	4.4%
118	12	2.83	2.4%	11	4.52	3.8%	23	3.45	2.9%
119	18	4.28	3.6%	12	4.98	4.2%	30	4.54	3.8%
120	24	5.76	4.8%	5	2.09	1.7%	29	4.42	3.7%
121	12	2.90	2.4%	15	6.32	5.2%	27	4.15	3.4%
122	15	3.66	3.0%	8	3.40	2.8%	23	3.57	2.9%
123	14	3.44	2.8%	6	2.57	2.1%	20	3.13	2.5%
124	7	1.74	1.4%	8	3.46	2.8%	15	2.36	1.9%
125	11	2.75	2.2%	4	1.74	1.4%	15	2.38	1.9%
126	9	2.27	1.8%	6	2.63	2.1%	15	2.40	1.9%
127	10	2.54	2.0%	13	5.75	4.5%	23	3.71	2.9%
128	3	0.77	0.6%	4	1.78	1.4%	7	1.14	0.9%
129	6	1.55	1.2%	5	2.25	1.7%	11	1.80	1.4%
130	13	3.38	2.6%	3	1.36	1.0%	16	2.64	2.0%
131	4	1.05	0.8%	8	3.65	2.8%	12	2.00	1.5%
132	11	2.90	2.2%	7	3.22	2.4%	18	3.02	2.3%
133		0.00	0.0%	4	1.85	1.4%	4	0.68	0.5%
134	4	1.07	0.8%	2	0.93	0.7%	6	1.02	0.8%
135	5	1.35	1.0%	3	1.41	1.0%	8	1.37	1.0%
136	2	0.54	0.4%		0.00	0.0%	2	0.35	0.3%
137	3	0.82	0.6%	2	0.95	0.7%	5	0.87	0.6%
138	5	1.38	1.0%	1	0.48	0.3%	6	1.05	0.8%
139	5	1.39	1.0%	2	0.97	0.7%	7	1.24	0.9%
140	4	1.12	0.8%		0.00	0.0%	4	0.71	0.5%
141	5	1.41	1.0%		0.00	0.0%	5	0.90	0.6%
142	1	0.28	0.2%		0.00	0.0%	1	0.18	0.1%
143	1	0.29	0.2%	2	1.00	0.7%	3	0.55	0.4%
144		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
145	1	0.29	0.2%	1	0.51	0.3%	2	0.37	0.3%
146		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
147	1	0.29	0.2%		0.00	0.0%	1	0.19	0.1%
148		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
149		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
150		0.00	0.0%		0.00	0.0%	0	0.00	0.0%
Total No.	500		63.5%	287		36.5%	787		100.0%
Mean		116.9			117.57			117.12	

Total legal crab	787
Total Recruits	239
Percent	30.4%
Total Post Recruits	548
Percent	69.6%

Table 4. Length frequency distribution of male crab captured at all stations during the Norton Sound Trawl Survey, August 7 - 18, 1996.

CARAPACE LENGTH (mm)	PRERECRUIT (Sublegal) No.	%	RECRUIT No.	%	POSTRECRUIT No.	%	TOTALS No.	%
25	1	0.3%		0.0%		0.0%	1	0.3%
26		0.0%		0.0%		0.0%	0	0.0%
27		0.0%		0.0%		0.0%	0	0.0%
28		0.0%		0.0%		0.0%	0	0.0%
29		0.0%		0.0%		0.0%	0	0.0%
30		0.0%		0.0%		0.0%	0	0.0%
31		0.0%		0.0%		0.0%	0	0.0%
32		0.0%		0.0%		0.0%	0	0.0%
33		0.0%		0.0%		0.0%	0	0.0%
34		0.0%		0.0%		0.0%	0	0.0%
35		0.0%		0.0%		0.0%	0	0.0%
36		0.0%		0.0%		0.0%	0	0.0%
37		0.0%		0.0%		0.0%	0	0.0%
38		0.0%		0.0%		0.0%	0	0.0%
39		0.0%		0.0%		0.0%	0	0.0%
40		0.0%		0.0%		0.0%	0	0.0%
41		0.0%		0.0%		0.0%	0	0.0%
42		0.0%		0.0%		0.0%	0	0.0%
43		0.0%		0.0%		0.0%	0	0.0%
44	1	0.3%		0.0%		0.0%	1	0.3%
45	1	0.3%		0.0%		0.0%	1	0.3%
46	2	0.6%		0.0%		0.0%	2	0.6%
47	2	0.6%		0.0%		0.0%	2	0.6%
48	1	0.3%		0.0%		0.0%	1	0.3%
49		0.0%		0.0%		0.0%	0	0.0%
50		0.0%		0.0%		0.0%	0	0.0%
51	1	0.3%		0.0%		0.0%	1	0.3%
52	1	0.3%		0.0%		0.0%	1	0.3%
53		0.0%		0.0%		0.0%	0	0.0%
54	2	0.6%		0.0%		0.0%	2	0.6%
55		0.0%		0.0%		0.0%	0	0.0%
56	2	0.6%		0.0%		0.0%	2	0.6%
57	3	1.0%		0.0%		0.0%	3	1.0%
58	1	0.3%		0.0%		0.0%	1	0.3%
59	3	1.0%		0.0%		0.0%	3	1.0%
60		0.0%		0.0%		0.0%	0	0.0%
61	5	1.6%		0.0%		0.0%	5	1.6%
62	4	1.3%		0.0%		0.0%	4	1.3%
63	9	2.9%		0.0%		0.0%	9	2.9%
64	3	1.0%		0.0%		0.0%	3	1.0%
65	7	2.2%		0.0%		0.0%	7	2.2%
66	4	1.3%		0.0%		0.0%	4	1.3%
67	4	1.3%		0.0%		0.0%	4	1.3%
68	6	1.9%		0.0%		0.0%	6	1.9%
69	4	1.3%		0.0%		0.0%	4	1.3%
70	8	2.5%		0.0%		0.0%	8	2.5%
71	16	5.1%		0.0%		0.0%	16	5.1%
72	13	4.1%		0.0%		0.0%	13	4.1%
73	14	4.5%		0.0%		0.0%	14	4.5%
74	6	1.9%		0.0%		0.0%	6	1.9%
75	4	1.3%		0.0%		0.0%	4	1.3%
76	4	1.3%		0.0%		0.0%	4	1.3%
77	8	2.5%		0.0%		0.0%	8	2.5%
78	6	1.9%		0.0%		0.0%	6	1.9%
79	6	1.9%		0.0%		0.0%	6	1.9%
80	6	1.9%		0.0%		0.0%	6	1.9%
81	4	1.3%		0.0%		0.0%	4	1.3%
82	8	2.5%		0.0%		0.0%	8	2.5%
83	7	2.2%		0.0%		0.0%	7	2.2%
84	4	1.3%		0.0%		0.0%	4	1.3%
85	1	0.3%		0.0%		0.0%	1	0.3%
86	7	2.2%		0.0%		0.0%	7	2.2%
87	5	1.6%		0.0%		0.0%	5	1.6%
88	3	1.0%		0.0%		0.0%	3	1.0%
89	6	1.9%		0.0%		0.0%	6	1.9%
90	5	1.6%		0.0%		0.0%	5	1.6%
91	3	1.0%		0.0%		0.0%	3	1.0%
92	4	1.3%		0.0%		0.0%	4	1.3%
93	4	1.3%		0.0%		0.0%	4	1.3%
94	3	1.0%		0.0%		0.0%	3	1.0%
95	4	1.3%		0.0%		0.0%	4	1.3%
96	5	1.6%		0.0%		0.0%	5	1.6%
97	4	1.3%		0.0%		0.0%	4	1.3%
98	2	0.6%		0.0%		0.0%	2	0.6%
99	4	1.3%		0.0%		0.0%	4	1.3%
100		0.0%		0.0%		0.0%	0	0.0%

continued on next page

Table 4. Length frequency distribution of male crab captured at all stations during the Norton Sound Trawl Survey, August 7 - 18, 1996.

CARAPACE LENGTH (mm)	PRERECRUIT (Sublegal) No.	%	RECRUIT No.	%	POSTRECRUIT No.	%	TOTALS No.	%
101	4	1.3%		0.0%		0.0%	4	1.3%
102		0.0%	3	1.0%		0.0%	3	1.0%
103	1	0.3%	3	1.0%		0.0%	4	1.3%
104	1	0.3%	5	1.6%		0.0%	6	1.9%
105	1	0.3%		0.0%		0.0%	1	0.3%
106		0.0%	2	0.6%	1	0.3%	3	1.0%
107		0.0%	3	1.0%		0.0%	3	1.0%
108		0.0%	2	0.6%	1	0.3%	3	1.0%
109		0.0%	1	0.3%	1	0.3%	2	0.6%
110		0.0%	1	0.3%		0.0%	1	0.3%
111		0.0%	1	0.3%		0.0%	1	0.3%
112		0.0%	1	0.3%	3	1.0%	4	1.3%
113		0.0%	1	0.3%	3	1.0%	4	1.3%
114		0.0%		0.0%	3	1.0%	3	1.0%
115		0.0%		0.0%		0.0%	0	0.0%
116		0.0%		0.0%	2	0.6%	2	0.6%
117		0.0%		0.0%	2	0.6%	2	0.6%
118		0.0%		0.0%		0.0%	0	0.0%
119		0.0%		0.0%	1	0.3%	1	0.3%
120		0.0%		0.0%	1	0.3%	1	0.3%
121		0.0%		0.0%	3	1.0%	3	1.0%
122		0.0%		0.0%	1	0.3%	1	0.3%
123		0.0%		0.0%		0.0%	0	0.0%
124		0.0%		0.0%		0.0%	0	0.0%
125		0.0%		0.0%	2	0.6%	2	0.6%
126		0.0%		0.0%	2	0.6%	2	0.6%
127		0.0%		0.0%	2	0.6%	2	0.6%
128		0.0%		0.0%		0.0%	0	0.0%
129		0.0%		0.0%	3	1.0%	3	1.0%
130		0.0%		0.0%	1	0.3%	1	0.3%
131		0.0%		0.0%	1	0.3%	1	0.3%
132		0.0%		0.0%	1	0.3%	1	0.3%
133		0.0%		0.0%		0.0%	0	0.0%
134		0.0%		0.0%		0.0%	0	0.0%
135		0.0%		0.0%		0.0%	0	0.0%
136		0.0%		0.0%	6	1.9%	6	1.9%
137		0.0%		0.0%		0.0%	0	0.0%
138		0.0%		0.0%	1	0.3%	1	0.3%
139		0.0%		0.0%		0.0%	0	0.0%
140		0.0%		0.0%		0.0%	0	0.0%
141		0.0%		0.0%		0.0%	0	0.0%
142		0.0%		0.0%		0.0%	0	0.0%
143		0.0%		0.0%		0.0%	0	0.0%
144		0.0%		0.0%		0.0%	0	0.0%
145		0.0%		0.0%		0.0%	0	0.0%
146		0.0%		0.0%		0.0%	0	0.0%
147		0.0%		0.0%		0.0%	0	0.0%
148		0.0%		0.0%		0.0%	0	0.0%
149		0.0%		0.0%		0.0%	0	0.0%
150		0.0%		0.0%		0.0%	0	0.0%
151		0.0%		0.0%		0.0%	0	0.0%
152		0.0%		0.0%	1	0.3%	1	0.3%
153		0.0%		0.0%		0.0%	0	0.0%
154		0.0%		0.0%		0.0%	0	0.0%
155		0.0%		0.0%		0.0%	0	0.0%
156		0.0%		0.0%		0.0%	0	0.0%
157		0.0%		0.0%		0.0%	0	0.0%
158		0.0%		0.0%		0.0%	0	0.0%
159		0.0%		0.0%		0.0%	0	0.0%
160		0.0%		0.0%		0.0%	0	0.0%
161		0.0%		0.0%		0.0%	0	0.0%
162		0.0%		0.0%		0.0%	0	0.0%
163		0.0%		0.0%		0.0%	0	0.0%
164		0.0%		0.0%		0.0%	0	0.0%
165		0.0%		0.0%		0.0%	0	0.0%
166		0.0%		0.0%		0.0%	0	0.0%
167		0.0%		0.0%		0.0%	0	0.0%
168		0.0%		0.0%		0.0%	0	0.0%
169		0.0%		0.0%		0.0%	0	0.0%
170		0.0%		0.0%		0.0%	0	0.0%
171		0.0%		0.0%		0.0%	0	0.0%
172		0.0%		0.0%		0.0%	0	0.0%
173		0.0%		0.0%	1	0.3%	1	0.3%
Total No.	248	79.0%	23	7.3%	43	13.7%	314	100.0%

Table 5. Carapace length measurement summary of sampled female red king crab captured during the Norton Sound Trawl Survey, August 7 - 18, 1996.

Carapace Length (mm)	Juvenile (<73mm & no clutch) No.	Ave Length Calc.	%	Adult Percent Ovigerity Full (90-100)	Hi 0-89	Med 0-59	Low -29%)	0	Total	Ave Length Calc.	%
23	1	0.21	0.9%						0	0.00	0.0%
24		0.00	0.0%						0	0.00	0.0%
25		0.00	0.0%						0	0.00	0.0%
26		0.00	0.0%						0	0.00	0.0%
27		0.00	0.0%						0	0.00	0.0%
28		0.00	0.0%						0	0.00	0.0%
29		0.00	0.0%						0	0.00	0.0%
30		0.00	0.0%						0	0.00	0.0%
31		0.00	0.0%						0	0.00	0.0%
32		0.00	0.0%						0	0.00	0.0%
33		0.00	0.0%						0	0.00	0.0%
34		0.00	0.0%						0	0.00	0.0%
35		0.00	0.0%						0	0.00	0.0%
36		0.00	0.0%						0	0.00	0.0%
37		0.00	0.0%						0	0.00	0.0%
38		0.00	0.0%						0	0.00	0.0%
39		0.00	0.0%						0	0.00	0.0%
40	1	0.37	0.9%						0	0.00	0.0%
41		0.00	0.0%						0	0.00	0.0%
42		0.00	0.0%						0	0.00	0.0%
43		0.00	0.0%						0	0.00	0.0%
44	4	1.61	3.7%						0	0.00	0.0%
45		0.00	0.0%						0	0.00	0.0%
46		0.00	0.0%						0	0.00	0.0%
47		0.00	0.0%						0	0.00	0.0%
48	1	0.44	0.9%						0	0.00	0.0%
49	1	0.45	0.9%						0	0.00	0.0%
50	2	0.92	1.8%						0	0.00	0.0%
51	2	0.94	1.8%						0	0.00	0.0%
52		0.00	0.0%						0	0.00	0.0%
53	2	0.97	1.8%						0	0.00	0.0%
54	1	0.50	0.9%						0	0.00	0.0%
55	2	1.01	1.8%						0	0.00	0.0%
56	2	1.03	1.8%						0	0.00	0.0%
57		0.00	0.0%						0	0.00	0.0%
58	2	1.06	1.8%						0	0.00	0.0%
59	4	2.17	3.7%						0	0.00	0.0%
60	2	1.10	1.8%						0	0.00	0.0%
61	7	3.92	6.4%						0	0.00	0.0%
62	6	3.41	5.5%						0	0.00	0.0%
63	5	2.89	4.6%						0	0.00	0.0%
64	8	4.70	7.3%						0	0.00	0.0%
65	5	2.98	4.6%						0	0.00	0.0%
66	6	3.63	5.5%						0	0.00	0.0%
67	5	3.07	4.6%						0	0.00	0.0%
68	10	6.24	9.2%			1			1	1.21	1.8%
69	5	3.17	4.6%		2				2	2.46	3.6%
70	10	6.42	9.2%						0	0.00	0.0%
71	7	4.56	6.4%						0	0.00	0.0%
72	8	5.28	7.3%		1				1	1.29	1.8%
73		0.00	0.0%	1	1			3	5	6.52	8.9%
74		0.00	0.0%			1		2	3	3.96	5.4%
75		0.00	0.0%	1		1		2	4	5.36	7.1%
76		0.00	0.0%		1	1		1	3	4.07	5.4%
77		0.00	0.0%			1			1	1.38	1.8%
78		0.00	0.0%		2		1	2	5	6.96	8.9%
79		0.00	0.0%	1				2	3	4.23	5.4%
80		0.00	0.0%		1				1	1.43	1.8%
81		0.00	0.0%		2	1			3	4.34	5.4%
82		0.00	0.0%		3	1			4	5.86	7.1%
83		0.00	0.0%	2					2	2.96	3.6%
84		0.00	0.0%		2		1		3	4.50	5.4%
85		0.00	0.0%						0	0.00	0.0%
86		0.00	0.0%	1	1	1			3	4.61	5.4%
87		0.00	0.0%	1					1	1.55	1.8%
88		0.00	0.0%		1				1	1.57	1.8%
89		0.00	0.0%	1					1	1.59	1.8%
90		0.00	0.0%		1				1	1.61	1.8%
91		0.00	0.0%		1				1	1.63	1.8%
92		0.00	0.0%		1				1	1.64	1.8%
93		0.00	0.0%	1					1	1.66	1.8%
94		0.00	0.0%						0	0.00	0.0%
95		0.00	0.0%		1				1	1.70	1.8%
96		0.00	0.0%		2				2	3.43	3.6%
97		0.00	0.0%						0	0.00	0.0%
98		0.00	0.0%						0	0.00	0.0%
99		0.00	0.0%						0	0.00	0.0%
100		0.00	0.0%						0	0.00	0.0%
101		0.00	0.0%						0	0.00	0.0%
102		0.00	0.0%						0	0.00	0.0%
103		0.00	0.0%	1					1	1.84	1.8%
104		0.00	0.0%						0	0.00	0.0%
105		0.00	0.0%						0	0.00	0.0%
106		0.00	0.0%						0	0.00	0.0%
107		0.00	0.0%						0	0.00	0.0%
108		0.00	0.0%						0	0.00	0.0%
109		0.00	0.0%						0	0.00	0.0%
110		0.00	0.0%	1					1	1.96	1.8%
Total No.	109		66.1%	11	23	8	2	12	56		33.9%
Mean Length		63.0								81.32	
		% Adult Ovigerity:		20%	41%	14%	4%	21%			

Table 6. Red king crab tag information recovered during the commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, July 1 - September 3, 1996.

Tag Number	Capture Date	Stat. Area of Capture	Carapace engthh (mm)	Shell Age	Tagging Date	Carapace Lenght (mm)	Growth (mm)	No. of Molts[b]	Skip Molts	Mean Growth per Molt (mm)
NX01847	8/17/96	666330	135	Old	4/16/90	101	34	3	3	11
NX02810 [a]	7/15/96	636330			3/3/95	115				
NX02814	7/16/96	656401	118	Old	3/3/95	116	2			
NX02834 [a]	7/12/96	656402			3/3/95	102				
NX02858 [a]	7/15/96	636330			3/6/95	110				
NX02859	8/25/96	676400	117	New	3/6/95	105	12	1		12
NX02873	7/18/96	656401	123	Old	3/6/95	123	0			
NX02901	8/19/96	636401	114	New	3/9/95	100	14	1		14
NX02917	8/31/96	666330	131	New	3/24/95	120	11	1		11
NX02949	8/20/96	666330	123	Old	3/22/95	123	0			
NX02970	8/11/96	666330	111	New	3/7/95	101	10	1		10
NX03008	8/29/96	676400	109	Old	3/9/95	110	-1		1	
NX03028	7/14/96	656330	119	New	3/13/95	105	14	1		14
NX03127	8/25/96	666330	113	New	3/14/95	100	13	1		13
NX03155	8/25/96	676400	121	New	3/14/95	111	10	1		10
NX03180	8/20/96	666330	119	New	3/16/95	106	13	1		13
NX03202	8/29/96	666330	99	New	2/16/96	99	0			
NX03252	8/31/96	676400	115	New	2/14/96	116	-1			
NX03356	8/15/96	666401	125	New	2/13/96	126	-1			
NX03494	7/13/96	656401	109	New	3/27/95	97	12	1		12
NX03518	8/29/96	676400	95	New	3/8/96	95	0			
NX03602	8/11/96	656330	96	New	3/18/96	97	-1			
NX03678	7/17/96	656401	96	New	3/19/96	96	0			
NZ02706	8/29/96	666330	95	New	3/22/96	76	19	1		19

13

[a] No length information available.

[b] Crab growth of 12 mm (+/- 5mm) per year is thought to be the average growth in one molting period.

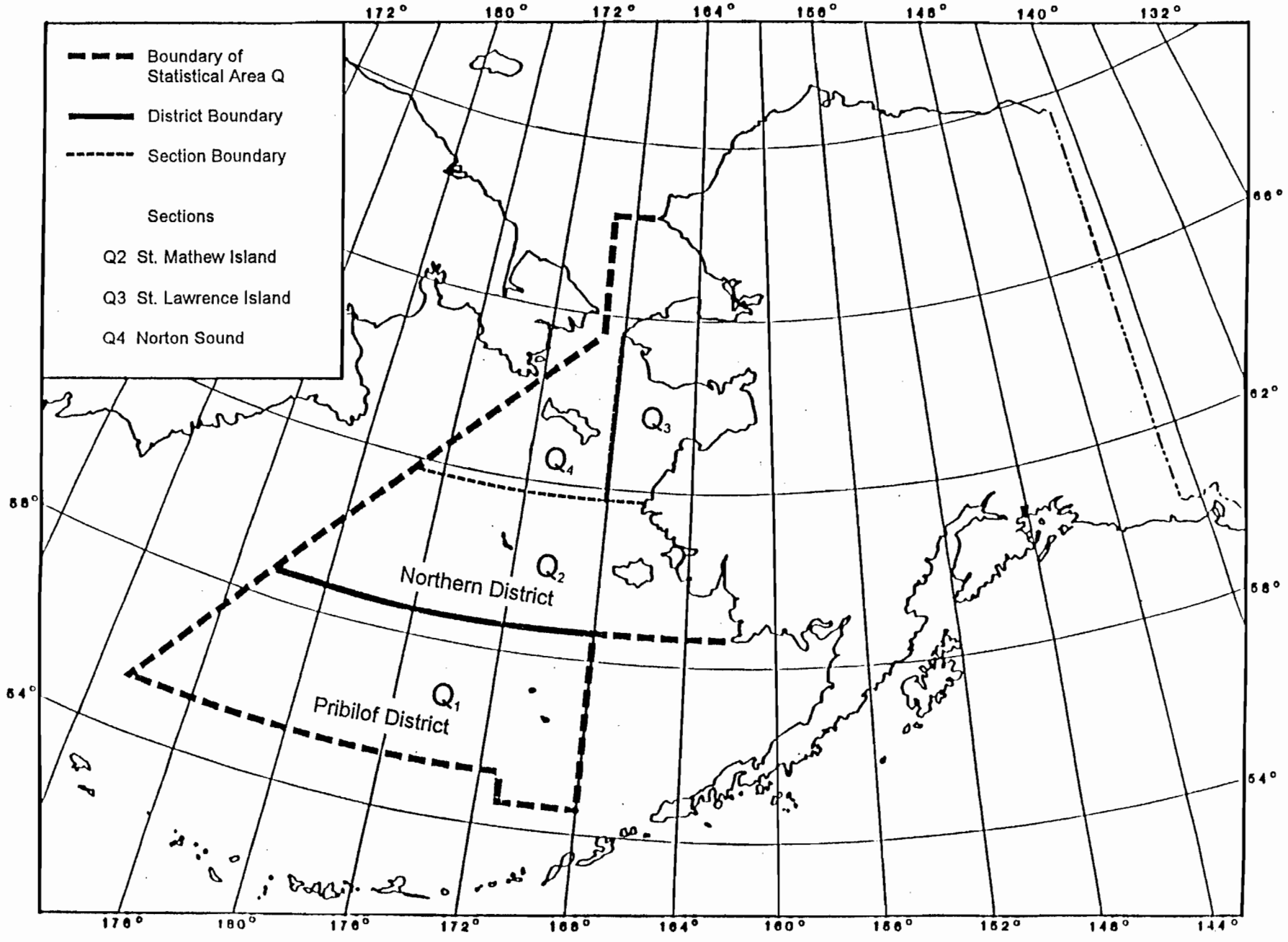

Figure 1. King crab fishing districts and sections of Statistical Area Q

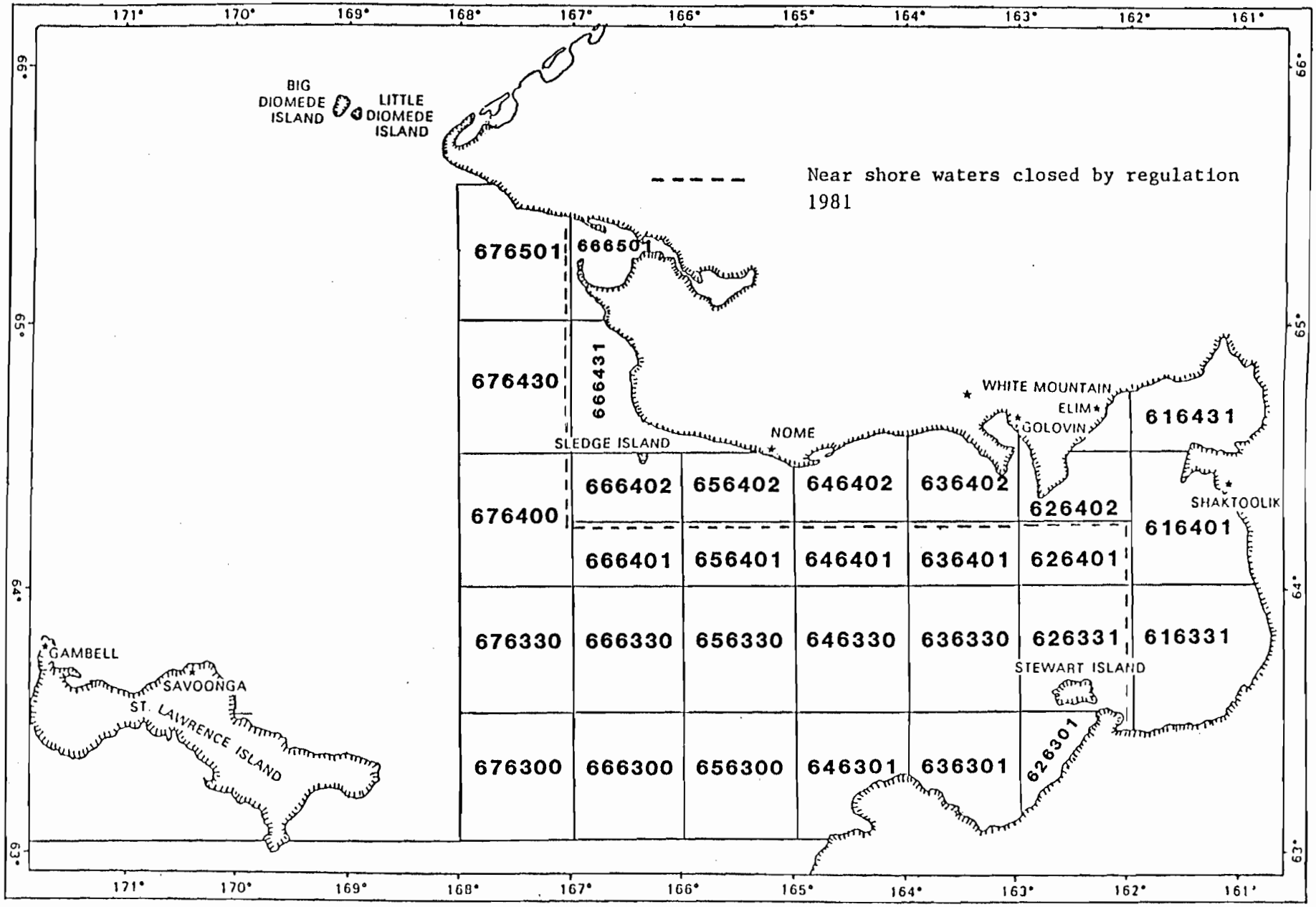

Figure 2. Statistical areas for the Norton Sound red king crab fishery.

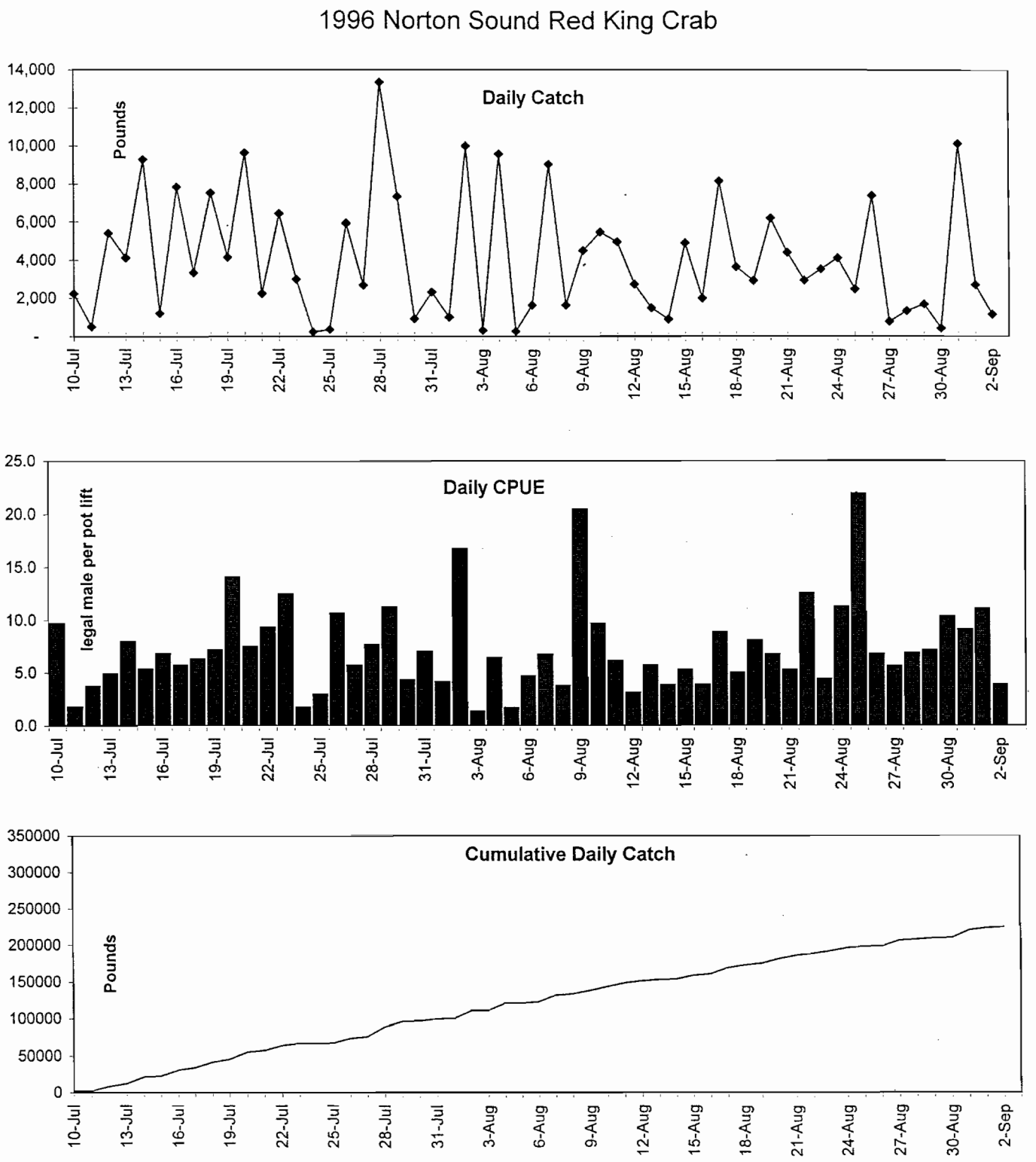

Figure 3. Daily catch, daily CPUE, and cumulative daily catch, Norton Sound summer commercial red king crab fishery, July 1 - August 3, 1996.

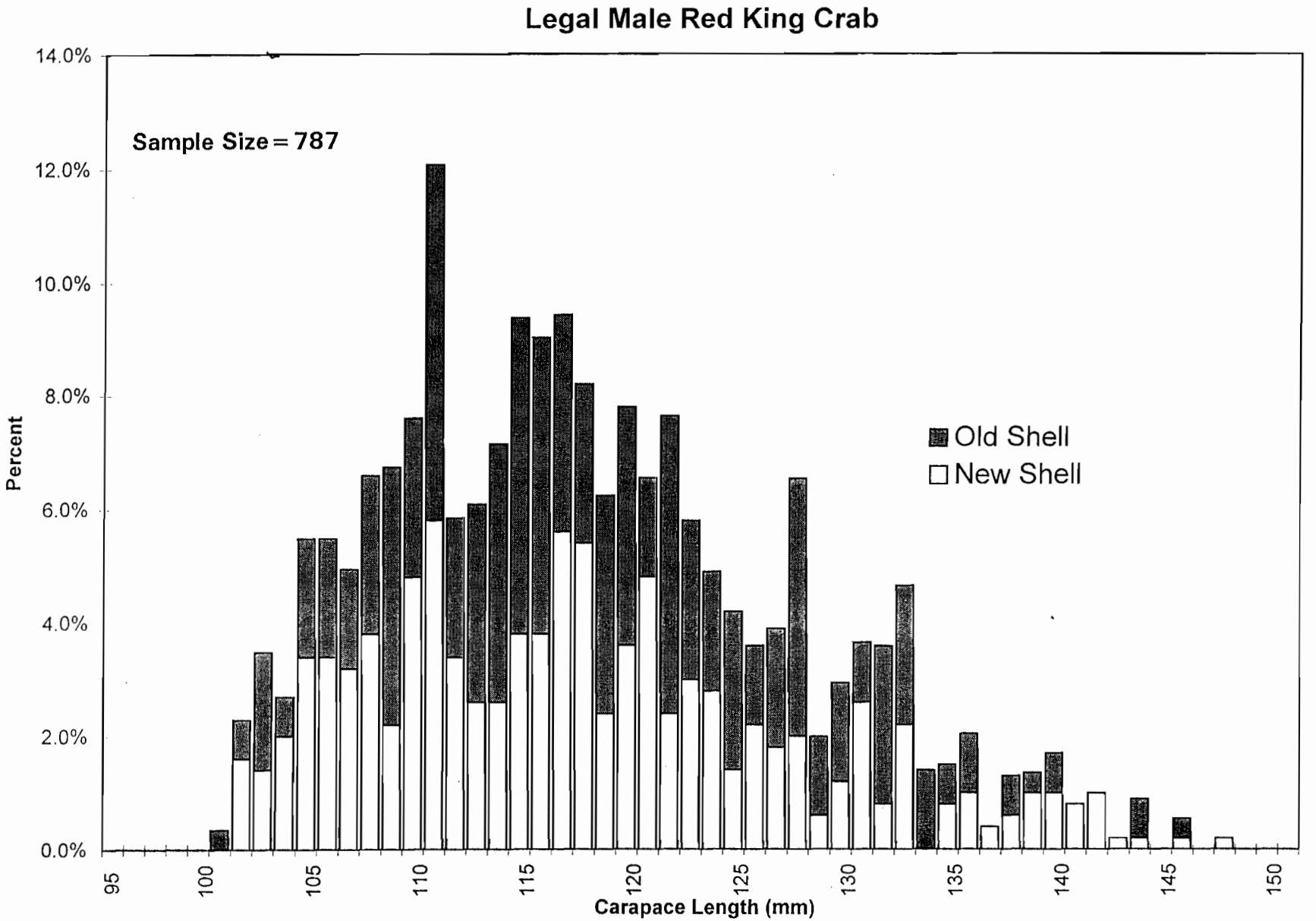

Figure 4. Length frequency distribution of the commercial catch samples with new and old carapace age condition of legal male red king crab,Norton Sound Section, Eastern Bering Sea, July 1 - September 3, 1996.

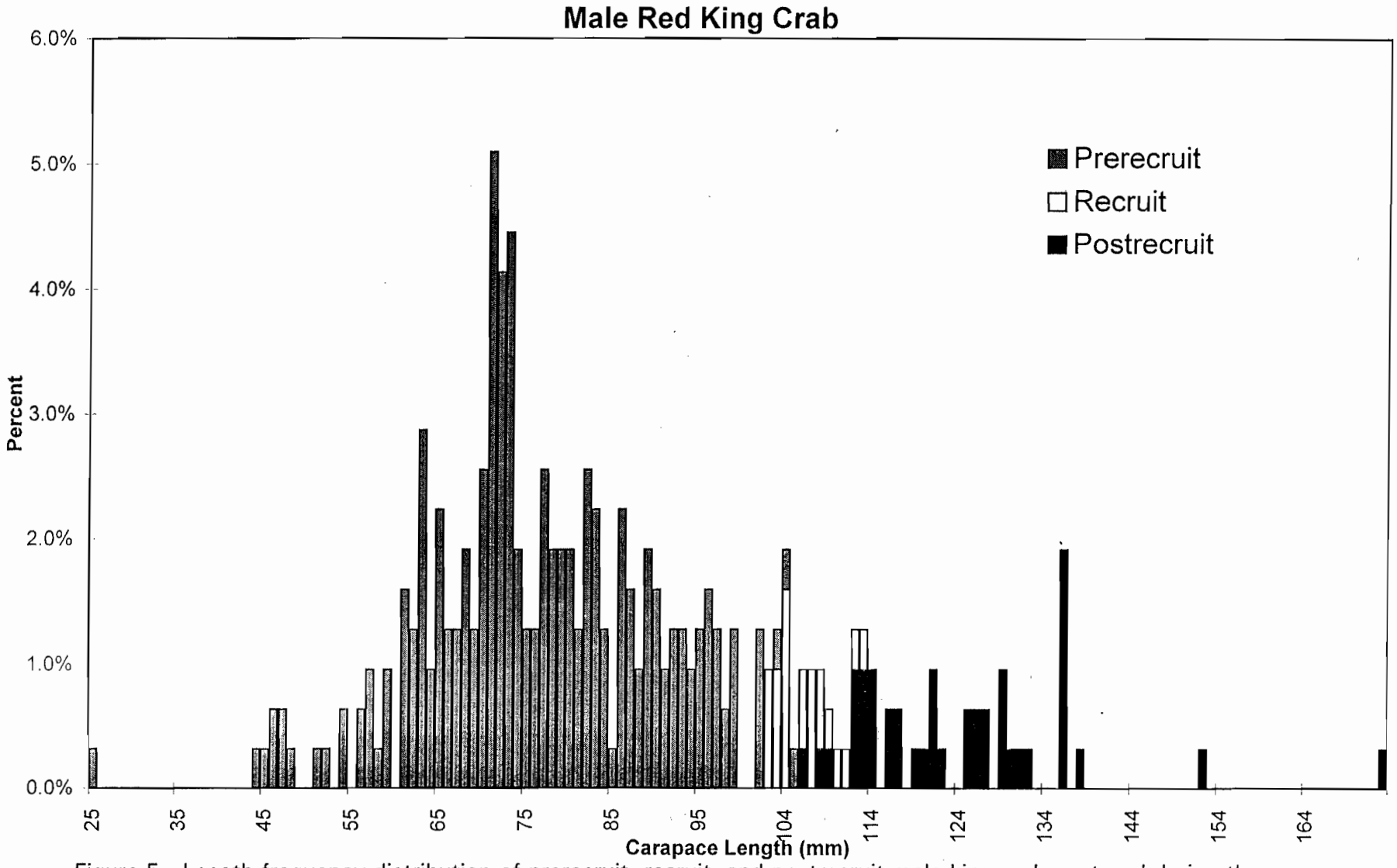

Figure 5. Length frequency distribution of prerecruit, recruit, and postrecruit male king crab captured during the Norton Sound Trawl Survey, August 7 - 18, 1996.

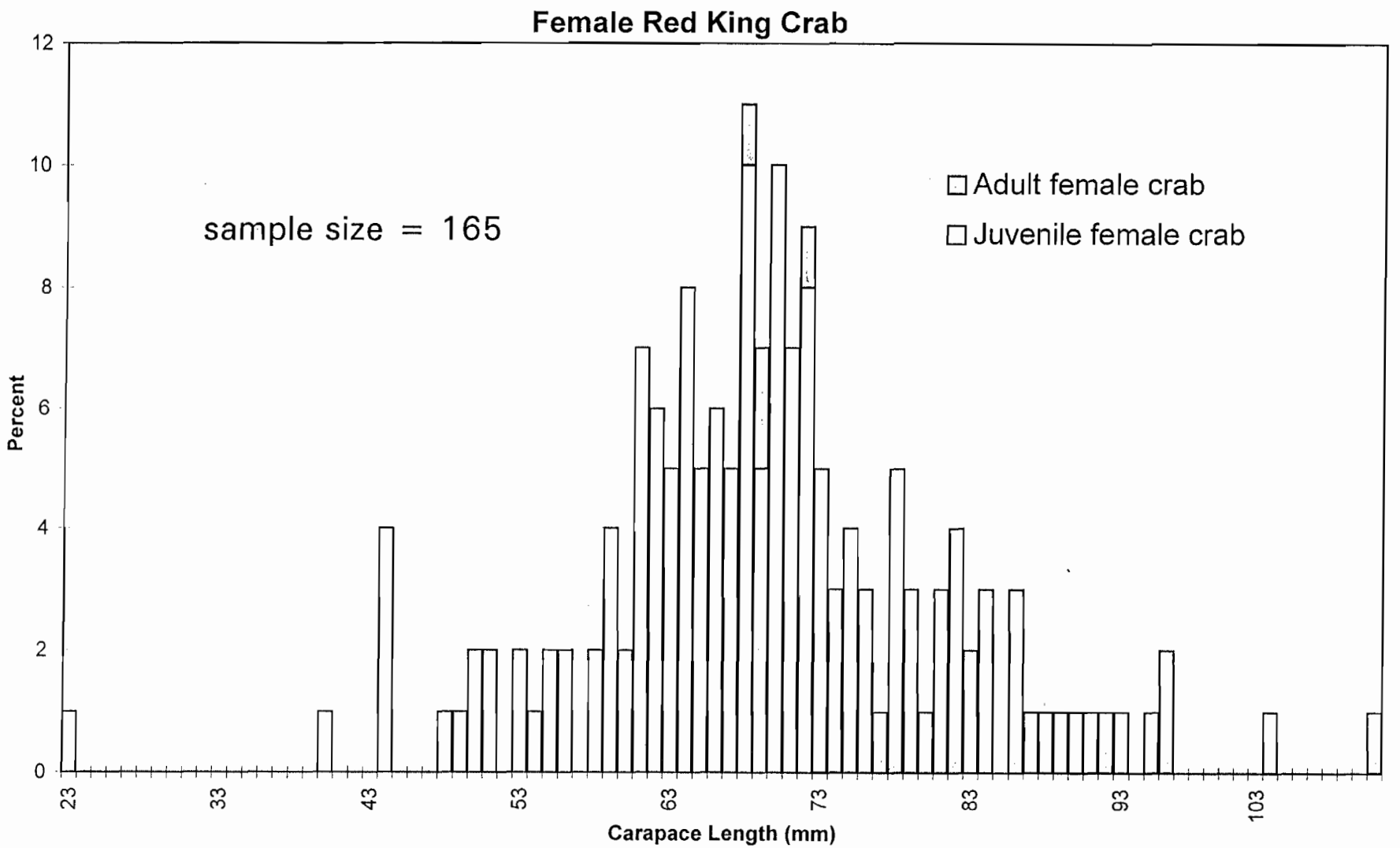

Figure 6. Length frequency distribution of female red king crab, juveniles and adults, captured during the Norton Sound Trawl Survey, August 7 - 18, 1996.

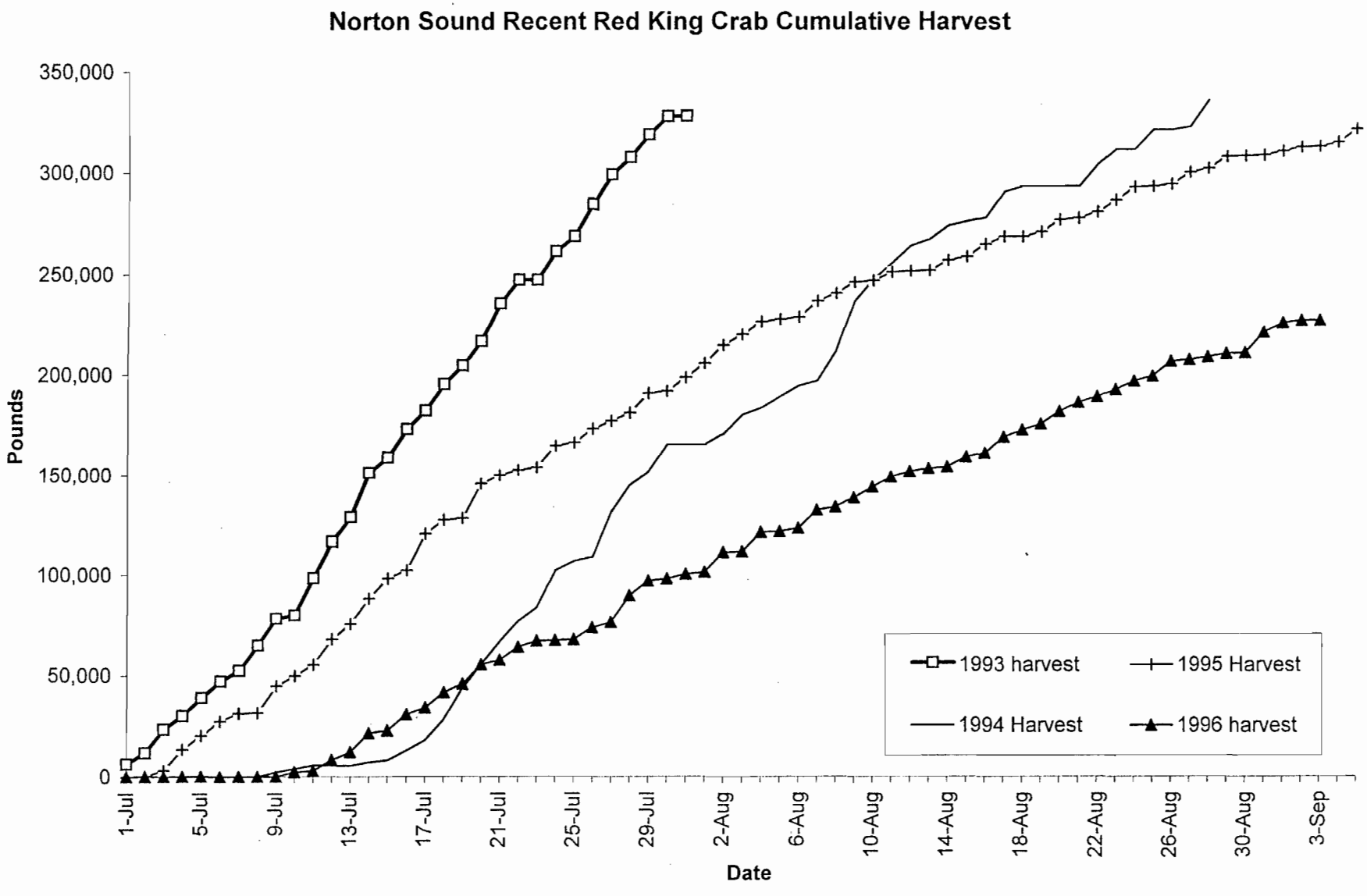

Figure 7. Recent Norton Sound summer commercial red king crab cumulative harvest, 1993 - 1996.

Appendix Table 1. Comparison of annual summer commercial harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1977-1996 (catch in pounds).[a]

Statistical Area	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1992	1993	1994	1995	1996[b]	Totals
616331	7,893																48			7,941
616401																		35		35
626331	40,020					22													61	40,103
626401	31,572			4,830	399													18,971	45,045	100,817
626402	38,995																			38,995
636330																			4,560	4,560
636401				12,398	61,823	32,246	5,880	41	891				22,030		1,159	1,373	8,087	24,329	70,677	240,934
636402																	1,754	3,466		5,220
646301																		4,628	13,888	18,516
646330					4,716								5,212					1,493	2,894	14,315
646401			155,972		1,319	17,532										1,963	37,222	105,045	22,834	341,887
646402	80,969					748										730	143,511	66,821		292,779
656300			161,699		15,174															176,873
656330			323,518	72,735	395,662	3,983	24,246	83,479	7,632		79,006	36,129	1,757		4,814	265		19,745	15,446	1,068,417
656401			138,011	121,147	253,387	60,480	11,422	183,119	246,200		194,408	165,644	100,956	171	53,119	105,341	29,566	32,289	9,985	1,705,245
656402	306,302	90,187	288,869	918	3,098	2,832			132,363							193,079	106,053	44,000		1,167,701
666230		55,490			77															55,567
666300		162,795	60,816	84,874	9,167	95		4,534											25,519	347,800
666330		353,016	505,050	367,446	141,513	8,990	1,192		389	70,615	2,963	13,020	1,275	27,185	4,305	31,758		730		1,529,447
666401		179,212	486,947	205,400	381,510	79,580	325,045	116,254	5,341	408,848	50,744	21,895	115,257	162,263	10,632	746	396		3,001	2,553,071
666402	12,036	515,778	534,938	183,581		17,585			32,992							535	1,221			1,298,666
666431			146,029															1,124		147,153
676300		13,238		126,231															546	140,015
676330		51,304	81,798	6,762	18,734															158,598
676400		667,130	33,856	274	92,026	1,315	247		32					3,212					9,775	807,867
676430		3,811	12,309		373	3,513			1,171											21,177
676501					36															36
686330			1,860																	1,860
Totals	517,787	2,091,961	2,931,672	1,186,596	1,379,014	228,921	368,032	387,427	427,011	479,463	327,121	236,688	246,487	192,831	74,029	335,790	327,858	322,676	224,231	12,285,595

[a] No commercial fishery occured in 1991.

[b] Does not include approximately 2,490 lbs not reported on fish tickets.

Appendix Table 2. Historic summer commercial red king crab harvest, Norton Sound Section, Eastern Bering Sea, 1977 - 1996.

Year	Number of Vessels	Number of Permits	Number of Landings	Number of Crab	Harvest (lbs) [a,b]	Number of Pot Lifts	CPUE	Percent Old Shell	Average Weight (lbs)	Avg. Legal Mean Length(mm)
1977	7	7	13	195,877	0.52	5,457	36	[d]	2.7	113.4
1978	8	8	54	660,829	2.09	10,817	64	[d]	3.0	118.9
1979	34	34	76	970,962	2.93	34,773	28	[d]	3.0	119.8
1980	9	9	50	329,778	1.19	11,199	29	[d]	3.6	125.8
1981	36	36	108	376,313	1.38	33,745	11	[d]	3.7	128.5
1982	11	11	33	63,949	0.23	11,230	6	[d]	3.6	125.4
1983	23	23	26	132,205	0.37	11,195	12	[d]	2.8	115.2
1984	8	8	21	139,759	0.39	9,706	14	[d]	2.8	112.5
1985	6	6	72	146,669	0.43	13,209	11	[d]	2.9	115.8
1986	3	3	[d]	162,438	0.48	4,284	38	[d]	2.9	115.9
1987	9	9	[d]	103,338	0.33	10,258	10	13	3.2	121.7
1988	2	2	[d]	76,148	0.24	2,350	32	26	3.1	119.0
1989	10	10	[d]	79,116	0.25	5,149	15	29	3.1	119.8
1990	4	4	[d]	59,132	0.19	3,172	19	17	3.1	121.1
1991 [c]										
1992	27	27	[d]	24,902	0.07	5,746	4	29	3.0	119.7
1993	14	20	208	115,913	0.33	7,063	16	10	2.9	119.1
1994	34	52	407	108,824	0.32	11,729	9	71	3.0	118.8
1995	48	81	665	105,967	0.32	18,782	5.6	21	3.0	118.2
1996	41	50	264	74,752	0.22	10,453	7.1	36	3.0	117.1

[a] Deadloss included in total.

[b] Millions of pounds.

[c] No summer commercial fishery.

[d] Information not available.

Appendix Table 3. Historic summer commercial red king economic performance, Norton Sound Section, Eastern Bering Sea, 1977 - 1996.

Year	Guidline Harvest Level (lbs) [b]	Legal Male Pop. Est.(lbs) [b]	Commercial Harvest (lbs) [a,b]	Number of Vessels	Number of Permits	Number of Landings	Number of Pots Registered	Number of Pots Pulls	Exvessel Price/lb ($)	Fishery Value (millions $)	Season Length Days	Season Length Dates
1977	[d]	10.0	0.52	7	7	13	[d]	5,457	0.75	0.229	60	[d]
1978	3.00	11.0	2.09	8	8	54	[d]	10,817	0.95	1.897	60	6/7-8/15
1979	3.00	5.4	2.93	34	34	76	[d]	34,773	0.75	1.878	16	7/15-7/31
1980	1.00	6.6	1.19	9	9	50	[d]	11,199	0.75	0.890	16	7/15-7/31
1981	2.50	4.7	1.38	36	36	108	[d]	33,745	0.85	1.172	38	7/15-8/22
1982	0.50	1.3	0.23	11	11	33	[d]	11,230	2.00	0.405	23	8/9-9/1
1983	0.30	2.1	0.37	23	23	26	3,583	11,195	1.50	0.537	3.8	8/1-8/5
1984	0.40	2.7	0.39	8	8	21	1,245	9,706	1.02	0.395	13.6	8/1-8/15
1985	0.45	2.4	0.43	6	6	72	1,116	13,209	1.00	0.427	21.7	8/1-8/23
1986	0.42	2.8	0.48	3	3	[d]	578	4,284	1.25	0.600	13	8/1-8/25 [e]
1987	0.40	2.2	0.33	9	9	[d]	1,430	10,258	1.50	0.491	11	8/1-8/12
1988	0.20	3.2	0.24	2	2	[d]	360	2,350	[d]	[d]	9.9	8/1-8/11
1989	0.20	3.2	0.25	10	10	[d]	2,555	5,149	3.00	0.739	3	8/1-8/4
1990	0.20	3.2	0.19	4	4	[d]	1,388	3,172	[d]	[d]	4	8/1-8/5
1991 [c]	0.34	3.4										
1992	0.34	3.4	0.07	27	27	[d]	2,635	5,746	1.75	0.130	2	8/1-8/3
1993	0.34	3.4	0.33	14	20	208	560	7,063	1.28	0.430	52	7/1-8/28 [f]
1994	0.34	3.4	0.32	34	52	407	1,360	11,729	2.02	0.646	31	7/1-7/31
1995	0.34	3.4	0.32	48	81	665	1,900	18,782	2.87	0.926	67	7/1-9/5
1996	0.34	3.4	0.22	41	50	264	1,640	10,453	2.29	0.519	57	7/1-9/3 [g]

[a] Deadloss included in total.

[b] Millions of pounds.

[c] No summer commercial fishery.

[d] Information not available.

[e] Fishing actually began 8/12due to late arrival of fishing fleet.

[f] Fishing actually began 7/8 due to late arrival of fishing fleet.

[g] Fishing actually began 7/9 due to fishermen's strike.

Appendix Table 4. Comparison of percent recruit and postrecruit king crab sampled from summer commercial fisheries Norton Sound Section, Eastern Bering Sea, 1983 - 1996.

	Summer Commercial	
	Recruits	Postrecruits
Year	(%)	(%)
1983	55	45
1984	59	41
1985	45	55
1986	48	52
1987	22	78
1988	25	75
1989	23	77
1990	21	79
1991 [a]		
1992	28	72
1993	31	69
1994	14	86
1995	36	64
1996	30	70

[a] No data collected in summer 1991 due to closed fishery.

Appendix Table 5. Results of the population assessment surveys conducted for red king crab in Norton Sound since 1976.

				Number of Red King Crab Captured[a]			Population Estimates of Legal Male Crab[c]		
Year	Date	Research Agency	Vessel	Gear Effort	Sublegal Males	Legal[b] Males	Females	Numbers	Pounds
1976	9/02 - 9/05 9/16 -10/07	NMFS	Miller-Freeman	Trawl 158 tows	768	555	180	3,119,800	8,111,480
1979	7/26 - 8/05	NMFS	Miller-Freeman	Trawl 71 tows	46	194	40	837,241	2,511,723
1980	7/04 - 7/14	ADF&G	Altair	Pots 397 lifts	443	3,290	158	1,900,000	6,600,000 [d]
1981	6/28 - 7/14	ADF&G	Altair	Pots 718 lifts	4,097	3,415	1,933	1,285,195	4,755,221
1982	7/06 - 7/20	ADF&G	Aleutian #1	Pots 689 lifts	5,019	2,001	424	353,273	1,271,783
1982	9/05 - 9/11	NMFS	Miller-Freeman	Trawl 50 tows	322	107	265	970,646	2,620,744
1985	7/01 - 7/14	ADF&G	Arctic Sea	Pots 642 lifts	6,086	4,645	181	907,579	2,414,644
1985	9/16 -10/01	NMFS	Argosy	Trawl 78 tows	266	163	151	1,203,000	3,369,000
1988	8/16 - 8/30	NMFS	Miller-Freeman	Trawl 82 tows	258	141	218	1,037,000	3,038,000
1991	8/22 - 8/30	NMFS	Ocean Hope	Trawl 53 tows	202	178	105	1,384,000	[e]4,009,000
1996	8/7 - 8/18	ADF&G	Peggy Jo	Trawl 69 tows	250	67	168	534,446	1,603,339

[a] Number of crab captured on ADF&G surveys from 1980-1985 represent data standardized for a 24 hour soak.

[b] Legal male red king crab were defined as at least 106mm in carapace length for the 1976 NMFS survey; 105mm for the 1979 and 1985 NMFS survey; and at least 121mm in carapace width for all ADF&G surveys.

[c] Population estimates are valid for the date of the survey, ie either before or after the summer commercial fishery.

[d] The 1980 estimate has been revised from the original estimate of 13.4 million pounds. The original estimate was thought inaccurate due to under-reporting of recovered tagged crab.

[e] The population estimate for the entire sound is recorded here, but only 3,400,000pounds were estimated in waters open to the summer comercial fishery.

Appendix Table 6. Observer crab catch summary: number of observed pot lifts, percent of catch by legal male, sublegal male and female crab; and average crab per pot; Norton Sound summer commercial fishery, 1988 - 1996.

Year	# Pots Observed	Legal Male Crab		Sublegal Male Crab		Female Crab	
		%	Crab per Pot	%	Crab per Pot	%	Crab per Pot
1988	1673	81.6	35.4	17.1	7.4	1.3	0.6
1989	909	68.5	13.7	15.4	3.1	16.1	3.2
1990	168	77.8	13.6	21.0	3.7	1.2	0.2
1992	733	70.1	1.9	22.7	0.6	7.3	0.2
1993	0	-	-	-	-	-	-
1994	199	60.7	7.7	34.1	4.3	5.2	0.7
1995	99	60.5	2.5	29.0	1.2	10.5	0.4
1996	0	-	-	-	-	-	-

Appendix Table 7. Winter commercial and subsistence red king crab harvests, Norton Sound Section, Eastern Bering Sea, 1978-1996.

Commercial			Subsistence						
Year[a]	Fishermen	# Crab Harvested	Winter[b]	Permits Issued	Permits Returned	Permits Fished	Total Crab Caught[c]	Total Crab Harvested[d]	Average Harvest/fm
1978	37	9,625	1977-78	290	206	149	[e]	12,506	84
1979	1	221	1978-79	48	43	38	[e]	224	6
1980	1	22	1979-80	22	14	9	[e]	213	24
1981	0	0	1980-81	51	39	23	[e]	360	16
1982	1	17	1981-82	101	76	54	[e]	1,288	24
1983	5	549	1982-83	172	106	85	[e]	10,432	123
1984	8	856	1983-84	222	183	143	15,923	11,220	78
1985	9	1,168	1984-85	203	166	132	10,757	8,377	63
1986	5	2,168	1985-86	136	133	107	10,751	7,052	66
1987	7	1,040	1986-87	138	134	98	7,406	5,772	59
1988	10	425	1987-88	71	58	40	3,573	2,724	68
1989	5	403	1988-89	139	115	94	7,945	6,126	65
1990	13	3,626	1989-90	136	118	107	16,635	12,152	114
1991	11	3,800	1990-91	119	104	79	9,295	7,366	93
1992	13	7,478	1991-92	158	105	105	15,051	11,736	112
1993	8	1,788	1992-93	88	79	37	1,193	1,097	30
1994	25	5,753	1993-94	118	95	71	4,894	4,113	58
1995	42	7,538	1994-95	166	131	97	7,777	5,426	56
1996	9	1,778	1995-96	84	44	35	2,936	1,679	48

[a] Prior to 1985 the winter commercial fishery occured from January 1 - April 30; As of March 1985, the winter commercial harvest may occur from November 15 - May 15.

[b] The winter subsistence fishery occurs during months of two calander years (as early as December, through May).

[c] The Number of crab actually caught; some may have been returned.

[d] The number of crab harvested is the number of crab caught and kept.

[e] Data unavailable.